

REMARKS

I. Introduction

At the time of the Office Action dated June 28, 2007, claims 1, 2, 4-12, 14-21, and 24-26 were pending in this application. In this Amendment, claims 1, 11, and 24 have been amended, and claims 25 and 26 have been canceled. Care has been exercised to avoid the introduction of new matter. Support for the amendment of the claims can be found in, for example, Figs. 2-6 and relevant description of the specification.

Claims 1, 2, 4-12, 14-21, and 24 are now active in this application, of which claims 1, 11, and 24 are independent. A Request for Continued Examination is filed herewith.

II. The Rejection of Claims 24-26 under 35 U.S.C. §112, Second Paragraph

With respect to claim 24, the Examiner asserted that the following limitation is unclear: “at least one of the plurality of pieces has an end portion that is wider in inside diameter and an end portion of another one of the plurality of pieces... is narrower in outside diameter.” Claim 24 has been amended and the issue pointed out by the Examiner has been obviated.

It is noted that the rejection of claims 25 and 26 has been rendered moot by the cancellation of the claims.

Therefore, Applicants respectfully solicit withdrawal of the rejection of claims 24-26.

III. The Rejection of Claims 1, 2, 6-8, 24, and 25 under 35 U.S.C. §103(a)

Claims 1, 2, 6-8, 24, and 25 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Applicants’ Admitted Prior Art (AAPA) in view of Carpenter et al. In the statement of the rejection, the Examiner asserted that the AAPA does not expressly teach that the

protection tube is composed of a plurality of pieces. The Examiner asserted that Carpenter et al. teaches the missing feature of the AAPA and concluded that it would have been obvious to modify the apparatus of the AAPA based on the teachings of Carpenter et al. to arrive at the claimed subject matter. It is noted that the rejection of claim 25 has been rendered moot by the cancellation of the claim.

Applicants submit that the AAPA and Carpenter et al., either individually or in combination, do not disclose or suggest a plasma processing apparatus including all the limitations recited in independent claim 1. Specifically, the applied combination does not teach, among other things, “the longest one of the plurality of pieces in axial length is disposed farthest from the sample chamber among the plurality of pieces,” as recited in claim 1.

As admitted by the Examiner, the AAPA does not teach the claimed plurality of pieces. In addition, Applicants emphasize that Carpenter et al. does not teach the claimed plurality of pieces.

Carpenter et al. discloses that the protection tube is composed of a plurality of tubular pieces disposed in the axial direction (see Fig. 2). However, it is apparent that Carpenter et al. is silent on sample and plasma chambers. Accordingly, Carpenter et al. does not teach any positional relationship between the “longest one of the plurality of pieces in axial length” and the “sample chamber.” In other words, Carpenter et al. does not teach axially-shorter pieces disposed closer to the sample chamber where the temperature gradient at the time of plasma processing is expected to be greater, and axially-longer pieces farther away from the sample chamber.

In contrast, claim 1 recites that the longest one of the plurality of pieces in axial length is disposed farthest from the sample chamber among the plurality of pieces. Accordingly, the

claimed subject matter can reduce an internal stress caused by thermal expansion of the protection tube resulting from a temperature difference between the plasma and sample chambers. The reduction of internal stress can prevent the protection tube from being damaged and a deposited material on the tube from being flaked or shed.

Based on the foregoing, the AAPA and Carpenter et al., either individually or in combination, do not disclose or suggest a plasma processing apparatus including all the limitations recited in independent claim 1. Dependent claims 2 and 6-7 are also patentably distinguishable over the AAPA and Carpenter et al. at least because these claims include all the limitations recited in independent claim 1.

Applicants further submit that the AAPA and Carpenter et al., either individually or in combination, do not disclose or suggest a plasma processing apparatus including all the limitations recited in independent claim 24. Specifically, the applied combination does not teach, among other things, the following limitations:

the plurality of pieces include:

a first piece having a first end;

a second piece having a second end to be inserted into the first end of the first piece; and

an inner diameter of the first end is greater than an outer diameter of the second end to couple the first and second ends loosely for allowing expansion of the other piece

The Examiner, referring to Fig. 2 of Carpenter et al., asserted that the reference teaches that the plurality of pieces of protection tube 30 can be coupled with tongue and groove interconnections. However, Carpenter et al. does not teach, at a minimum, “an inner diameter of the first end is greater than an outer diameter of the second end to couple the first and second ends loosely for allowing expansion of the other piece,” as recited in claim 24 (emphasis added).

In contrast, the claimed subject matter is configured to couple the first and second ends loosely for allowing expansion of the other piece. Accordingly, the claimed subject matter can allow the respective pieces of the protection tube to freely expand when subjected to heat at the time of plasma processing. As a result, the internal stress resulting from the thermal expansion can become smaller. The reduction of the internal stress can prevent the protection tube from being damaged and a deposited material on the tube from being flaked or shed.

Based on the foregoing, the AAPA and Carpenter et al., either individually or in combination, do not disclose or suggest a plasma processing apparatus including all the limitations recited in independent claim 24.

Applicants, therefore, respectfully solicit withdrawal of the rejection of the claims and favorable consideration thereof.

IV. The Rejection of Claims 4 and 5 under 35 U.S.C. §103(a)

Claims 4 and 5 have been rejected under 35 U.S.C. §103(a) as being unpatentable over the AAPA in view of Carpenter et al., and further in view of Carducci et al.

Claims 4 and 5 depend from independent claim 1. Applicants thus incorporate herein the arguments made in response to the rejection of claim 1 under 35 U.S.C. §103 for obviousness predicated upon the AAPA in view of Carpenter et al. The Examiner's additional comments and reference to Carducci et al. do not cure the deficiencies in the applied combination of the AAPA in view of Carpenter et al. Applicants, therefore, respectfully solicit withdrawal of the rejection of claims 4 and 5, and favorable consideration thereof.

V. The Rejection of Claims 9-12, 16-21, and 26 under 35 U.S.C. §103(a)

Claims 9-12, 16-21, and 26 have been rejected under 35 U.S.C. §103(a) as being unpatentable over the AAPA in view of Carpenter et al., and further in view of Kennedy et al. It is noted that the rejection of claim 26 has been rendered moot by the cancellation of the claim.

With respect to independent claim 11, the Examiner admitted that the AAPA does not teach that a protection tube can be disposed in the sample chamber, but asserted that Kennedy et al. teaches the missing feature of the AAPA. The Examiner also admitted that the combination of AAPA and Kennedy et al. does not teach the protection tube is composed of a plurality of pieces. However, the Examiner asserted that Carpenter et al. teaches the protection tube composed of a plurality of pieces.

Applicants submit that the AAPA, Carpenter et al., and Kennedy et al., either individually or in combination, do not disclose or suggest a plasma processing apparatus including all the limitations recited in independent claim 11. Specifically, the applied combination does not teach, among other things, “the longest one of the plurality of pieces in axial length is disposed farthest from the plasma chamber among the plurality of pieces,” as recited in claim 1.

Kennedy et al. discloses that processing chamber 2 includes liner 20, and Carpenter et al. teaches the protection tube composed of a plurality of pieces. However, it is apparent that Kennedy et al. and Carpenter et al. are silent on sample and plasma chambers. Accordingly, both Kennedy et al. and Carpenter et al. do not teach any positional relationship between the “longest one of the plurality of pieces in axial length” and the “plasma chamber.” In contrast, claim 11 recites that the longest one of the plurality of pieces in axial length is disposed farthest from the plasma chamber among the plurality of pieces.

Based on the foregoing, the AAPA, Carpenter et al., and Kennedy et al., either individually or in combination, do not disclose or suggest a plasma processing apparatus including all the limitations recited in independent claim 11. Dependent claims 12 and 16-21 are also patentably distinguishable over the AAPA, Carpenter et al., and Kennedy et al. at least because these claims include all the limitations recited in independent claim 11.

Applicants further submit that claims 9 and 10 are patentably distinguishable over the AAPA, Carpenter et al., and Kennedy et al. Claims 9 and 10 depend from independent claim 1. Applicants thus incorporate herein the arguments made in response to the rejection of claim 1 under 35 U.S.C. §103 for obviousness predicated upon the AAPA in view of Carpenter et al. The Examiner's additional comments and reference to Kennedy et al. do not cure the deficiencies in the applied combination of the AAPA in view of Carpenter et al.

Applicants, therefore, respectfully solicit withdrawal of the rejection of claims 9-12 and 16-21, and favorable consideration thereof.

VI. The Rejection of Claims 14 and 15 under 35 U.S.C. §103(a)

Claims 14 and 15 have been rejected under 35 U.S.C. §103(a) as being unpatentable over the AAPA and Carpenter et al. in view of Kennedy et al., and further in view of Carducci et al.

Claims 14 and 15 depend from independent claim 11. Applicants thus incorporate herein the arguments made in response to the rejection of claim 11 under 35 U.S.C. §103 for obviousness predicated upon the AAPA, Carpenter et al., and Kennedy et al. The Examiner's additional comments and reference to Carducci et al. do not cure the deficiencies in the applied combination of the AAPA, Carpenter et al., and Kennedy et al. Applicants, therefore,

respectfully solicit withdrawal of the rejection of claims 14 and 15, and favorable consideration thereof.

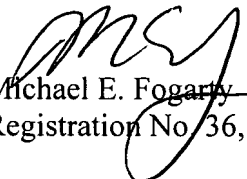
VII. Conclusion

It should, therefore, be apparent that the imposed rejections have been overcome and that all pending claims are in condition for immediate allowance. Favorable consideration is, therefore, respectfully solicited.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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